

Newton's Second Law - Force Calculations

$$F = m \times a$$

1. If a spaceship has a force of 19,620,000 N and a mass of 200,000 kg, what is the acceleration during lift-off?
2. What is the force created when a sports car that has a mass of 910 kg accelerates at a rate of 12 m/s²?
3. With what force will a car hit a tree if the car has a mass of 3,000 kg and it is accelerating at a rate of 2 m/s²?
4. A 10 kg bowling ball would require what force to accelerate it down an alleyway at a rate of 3 m/s²?
5. What is the mass of a falling rock if it hits the ground with a force of 147 N?
6. What is the acceleration of a softball if it has a mass of 0.50 kg and hits the catcher's glove with a force of 25 N?
7. What is the mass of a truck if it is accelerating at a rate of 5 m/s² and hits a parked car with a force of 14,000 N?
8. A sailboat and its crew have a combined mass of 655 kg. If a net force of 895 N is pushing the sailboat forward, what is the sailboat's acceleration?
9. The net forward force on the propeller of a 3.2 kg model airplane is 7.0 N. What is the acceleration of the airplane?
10. What is the net force needed to accelerate a 1600 kg car forward at 2.0 m/s²?